## (11) **EP 2 615 887 A3**

### (12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3: 29.10.2014 Bulletin 2014/44

(51) Int Cl.: **H05B** 33/08 (2006.01) **H02M** 3/335 (2006.01)

G09G 3/32 (2006.01)

(43) Date of publication A2: 17.07.2013 Bulletin 2013/29

(21) Application number: 12197899.3

(22) Date of filing: 18.12.2012

(84) Designated Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States:

**BA ME** 

(30) Priority: 10.01.2012 KR 20120003182

(71) Applicant: Samsung Electronics Co., Ltd. Gyeonggi-do 443-742 (KR)

(72) Inventors:

 Cho, Eun-il Gyeonggi-do (KR)

 Yi, Kang-hyun Chungcheongnam-do (KR)

 Yang, Joon-hyun Gyeonggi-do (KR)

(74) Representative: Davies, Robert Ean

Appleyard Lees 15 Clare Road Halifax

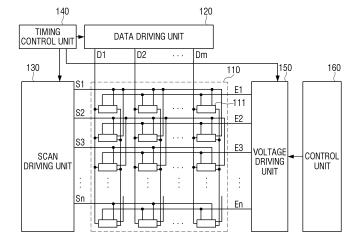
Yorkshire HX1 2HY (GB)

#### (54) Display apparatus and driving method thereof

(57) A display apparatus and driving method is provided. The display apparatus includes a power supply unit which supplies a DC voltage, a switch unit which is connected to the power supply unit in series and performs a switching operation according to different switching signals, a transformer unit which switches a voltage applied

to primary winding to secondary winding according to the switching operation of the switch unit, a synchronous rectifying unit which performs synchronous rectification with respect to the voltage induced to the secondary winding, and an output unit which outputs the rectified DC voltage.

# FIG. 1



EP 2 615 887 A3



#### **EUROPEAN SEARCH REPORT**

Application Number

EP 12 19 7899

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category	Citation of document with inc of relevant passa		Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
X	reference design us, 15 July 2010 (2010-0 XP055140860, ISBN: 978-1-60-9324 Retrieved from the URL:http://www.em.av esignzones/power/Doc-LLC-Reference-Desig [retrieved on 2014-0	07-15), pages 1-82, 17-9 Internet: vnet.com/en-us/design/d cuments/Microchip-DC-DC gn-Using-dsPIC-DSC.pdf 09-17]		INV. H05B33/08 G09G3/32 H02M3/335	
Υ	* the whole documen	t * 	11		
Х	"Reference Design SI High-Efficiency, LLC Converter with Secon Rectification",		1-12		
Υ	XP055140866, Retrieved from the	om/lit/ug/sluu467/sluu4 99-17]	11	TECHNICAL FIELDS SEARCHED (IPC) G09G H02M H05B	
A	"AN2450 Application note: LLC resonant half-bridge converter design guideline",		1-12		
	XP055140876, Retrieved from the	c.com/DownLoad/ST/AN245 99-17]			
	The present search report has b	een drawn up for all claims	1		
Place of search The Hague		Date of completion of the search		Examiner	
		17 September 201	September 2014 Vázquez		
CATEGORY OF CITED DOCUMENTS  X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		E : earlier patent do after the filing dat er D : document cited i L : document cited f 	T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons E: member of the same patent family, corresponding document		